

Appl. No. 10/737,078
DocId: No.14XZ126466/GEM-0108

REMARKS / ARGUMENTS

Status of Claims

Claims 1-38 are pending in the application. Reconsideration and allowance of the claims is respectfully requested upon entry of the following remarks.

Rejections Under 35 U.S.C. §103(a)

Claims 1-38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zylka et al., U.S. Patent No. 6,379,043 (hereinafter "Zylka") and further in view of Kienzle III et al., U.S. Patent No. 6,285,902 (hereinafter "Kienzle").

Applicants traverse these rejections for the following reasons.

To establish a *prima facie* case of obviousness, it is known that three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference(s) must teach or suggest all the claim limitations. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1996).

Regarding Claims 1 and 36-38

It is respectfully contended in the Office Action at the top of Page 3, that Zylka does not disclose "for an additional position that has not been taken by the device during the acquisition step, determining the projection parameter values associated to this additional position according to the parameters associated to the calibration positions" as recited in at least independent Claims 1 and 36-38. However, it is asserted that Kienzle at Column 4, lines 34-46, Column 11, lines 30+ and Column 17, lines 9+, discloses determining the projection parameter value associated to an additional position not taken by the device, according to the parameters associated to the calibration

Appin. No. 10/737,078
Docket No. 14XZ126466/GEM-0108

positions. It is further asserted that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this teaching of interpolating projection parameters and apply it to Zylka to save time during calibration. Applicants respectfully disagree.

Claims 1 and 36-38 recite, *inter alia*,

“...based on the acquisitions performed, determining the projection parameters associated to each calibration position of the device;
for an additional position that has not been taken by the device during the acquisition step, determining the projection parameter values associated to this additional position according to the parameters associated to the calibration positions.”

Kienzle discloses an image guided surgical system providing a surgeon with improved visualization of the relationship between a surgical tool and the involved body part by accurately superimposing representations of tools being used in the surgical field over the images of the body parts. (Col. 4, lines 5-46.) A preoperative determination of imaging model parameters, including projection and mapping parameters that closely model the imaging chain of the x-ray device and are determined by a process employing a *radiopaque calibration grid placed between the x-ray source and x-ray receiver. (Id.)* A mathematical model includes projecting and mapping points representing the surgical tool 128 onto the x-ray imager 114 by a conic projection model and mapping model, respectively. (Col. 11, lines 31-45) The development of the models requires that data regarding the C-arm 112 and x-ray imager 114 be collected during a *one time calibration procedure. (Id.)* The calibration grid is mounted on the input surface of the x-ray imager 124. (Col. 12, lines 33-35.) That is, the imaging model in Kienzle is created to map a surgical object and based on a calibration grid run through a separate calibration procedure.

Firstly, to support the rejection, the explanation in the Office Action broadly cites Column 11, lines 30+ and Column 17, lines 9+ as disclosing all of the above limitation of Claims 1 and 36-38. However, Applicants respectfully contend that the Examiner has not met the burden required for a §103 rejection and has not shown with specificity where

Appln. No. 10/737,078
Docket No. 14XZ126466/GEM-0108

in the reference the claimed elements as arranged in the claim, are disclosed in Kienzle. Applicants consider citation of Column 11, lines 30+ to include lines 30-45 and Column 17, lines 9+ to include lines 9-22. For the purpose of this response, Applicants assume that the "imaging model" and "points representing the surgical tool" in Kienzle as being considered the "projection parameters" and "additional position," respectively, of the claimed invention.

Secondly, following the above-mentioned assumptions, Kienzle discloses determining the imaging model with respect to a surgical tool and based on a calibration grid run through a separate calibration procedure specifically for the surgical tool. That is, there are no acquisitions prior to the separate calibration procedure disclosed in Kienzle. In fact, the calibration procedure is done prior to any other acquisition. The calibration grid is not "calibration positions of the device" as claimed. The grid is an external tool used specifically to model the surgical tool. That is, Kienzle does not disclose generating an imaging model based on calibration positions of the x-ray source/receiver, but on an external calibration grid. The imaging model of the surgical tool is taken totally *independently* from consideration of calibration points of the x-ray source/receiver device from a series of acquisitions to determine parameters for these calibration points. In fact, Kienzle is silent as to calibrating the x-ray source/receiver at all. Kienzle does not teach interpolating the imaging model from calibration points of the system, but directly generates the imaging model of the surgical tool.

Therefore, Kienzle does not teach or suggest based on the acquisitions performed, determining the projection parameters associated to each calibration position of the device and for an additional position that has not been taken by the device during the acquisition step, determining the projection parameter values associated to this additional position according to the parameters associated to the calibration positions as recited in Claims 1 and 36-38.

Appln. No. 10/737,078
Docket No. 14XZ126466/GEM-0108

Regarding Claims 9-13

As discussed above for Claims 1 and 36-28, Zylka and Kienzle do not disclose at least "an additional position" of the claimed invention. It necessarily follows then that "the projection parameters associated to the additional position are determined by an interpolation or extrapolation law of the projection parameters associated to the calibration positions," as recited and arranged in Claims 9-13 are not taught or suggested by Zylka and Kienzle, alone or in combination.

Regarding Claims 19-26

As discussed above for Claim 1, Zylka and Kienzle does not disclose at least "an additional position" of the claimed invention. Zylka and Kienzle necessarily do not disclose "the projection parameters associated to the additional position are determined by a combination of the projection parameters associated to the calibration positions of the device closest to the additional position, the number of positions taken into account being less than five" as recited and arranged in Claims 19-26.

As discussed above, Zylka and Kienzle, alone or in combination, *do not teach or suggest all of the limitations* of at least Claims 1, 9-13, 19-26 and 36-38. Thus, *prima facie* obviousness does not exist regarding Claims 1, 9-13, 19-26 and 36-38 with respect to the Zylka and Kienzle patents.

Notwithstanding Zylka and Kienzle failing to teach or suggest all of the limitations of the claimed invention, Applicants respectfully submit that there is no motivation to modify or combine the references as suggested by the Examiner.

Zylka relates to an x-ray examiner procedure, apparatus and method of forming distortion free x-ray images, which apparatus and method enable imaging properties of the C-arm X-ray system to be derived from the patient image by including elements of calibration members and their positions being reproduced in patient images. (Abstract.) As discussed above, Kienzle relates to image guided surgical system providing a surgeon with improved visualization of the relationship between a surgical tool and the involved

Appln. No. 10/737,078
Docket No. 14XZ126466/GEM-0108

body part by accurately superimposing representations of tools being used in the surgical field over the images of the body parts. (Col. 4, lines 5-46.)

Applicants find no disclosure in Zylka for determining the image model of an external tool to be used for distortion free images. There is no disclosure in Kienzle regarding forming distortion free images including elements of calibration members in relation to patient images, as Kienzle is primarily concerned with accurately superimposing representations of tools being used in the surgical field over the images of the body parts. (Col. 4, lines 5-46.) Zylka and Kienzle disclose completely different procedures and intended uses. Therefore, Applicants respectfully submit that there is no motivation to combine the references to teach the claimed invention.

Since Zylka and Kienzle fail to teach or suggest all of the limitations of Claims 1, 9-13, 19-26 and 36-38 as discussed above, and that there exists no disclosure in Zylka and Kienzle to modify the inventions, clearly, one of ordinary skill at the time of Applicants' invention would not have a motivation to modify or combine the references, nor a reasonable likelihood of success in forming the claimed invention by the Examiner's modifying or combining the references. Thus, here again, *prima facie* obviousness is unfounded. *Id.*

Thus, the requirements of *prime facie* obviousness are not met by the Examiner's 35 U.S.C. 103(a) rejection of Claims 1, 9-13, 19-26 and 36-38. Accordingly, reconsideration and withdrawal of the outstanding rejection of Claims 1, 9-13, 19-26 and 36-38 is respectfully requested. Applicants respectfully submit that Claims 1, 9-13, 19-26 and 36-38 are not further rejected or objected to and are allowable to Applicants. Claims 2-8, 14-18 and 27-35 variously depend from Claim 1. Therefore, Claims 2-8, 14-18 and 27-35 are correspondingly allowable as depending upon allowable Claim 1. Reconsideration, withdrawal of the relevant rejections and allowance of Claims 1-38 is respectfully requested.

Appl. No. 10/737,078
Docket No. 14XZ126466/GEM-0108

In light of the forgoing, Applicants respectfully submit that the Examiner's rejections under 35 U.S.C. §103(a), have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 50-2513.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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